



# **COLLIS PRIMARY SCHOOL**

## **MATHEMATICS POLICY**

## THE IMPORTANCE OF MATHEMATICS

“The special power of mathematics lies in its capacity not just to describe and explain but also to predict – to suggest possible answers to problems. It is not only taught because it is useful but it should also be a source of delight and wonder.” (National Curriculum Working Group)  
As a school we want to enable the children to see that mathematics provides a way of viewing and making sense of the world. It can be used to analyse and communicate ideas and information effectively and to tackle a range of practical tasks and real life problems.

## AIMS

Our aims in teaching Mathematics are that the children will:

- Enjoy the subject and study it with a sense of achievement.
- Achieve a high standard in numeracy and gain a secure foundation of knowledge, skills and concepts
- Use and apply these skills with confidence and understanding in real life problems and within Mathematics itself
- Develop persistence through sustained work over a period of time
- Develop an ability to think logically and to use mathematical language with confidence and understanding
- Have an appreciation of mathematical pattern and relationships
- Have a positive attitude towards mathematics as an interesting and creative subject

**Mathematics is a National Curriculum core subject** and is categorised into 4 attainment targets:

- Using and applying mathematics (Ma 1)
- Number (Ma 2)
- Shape, space and measures (Ma 3)
- Handling data. (Ma 4)

Opportunities for using and applying mathematics exist throughout the other three attainment targets.

The mathematics curriculum is organised as a discrete subject, yet there are many potential cross-curricular activities. It is taught in year groups, although there are some opportunities for both able pupils and those with special needs to work in separate groups aside from those who are attaining a level appropriate to their age.

The school will follow the requirements of the National Curriculum as set out in:

- *The National Curriculum Handbook for primary teachers in England (DfEE, 1999)*

And will follow the guidance contained in:

- *The Renewed Framework for teaching mathematics from Reception to Year 6 (2006)*

- *The National Numeracy Strategy Framework for teaching mathematics from Reception to Yr 6 (DfEE, 1999)*

## **KNOWLEDGE, SKILLS AND UNDERSTANDING**

During the course of their time at Collis Primary School the children will be introduced to a range of knowledge, skills and understanding.

### **Early Years Foundation Stage – Nursery and Reception:**

- Teachers use the Practice Guidance to plan for children to meet the requirements of the Early Years Foundation Stage framework. This outlines the knowledge, skills, understanding and attitudes children will need in order to achieve the Early Learning Goals in Problem Solving, Reasoning and Numeracy. These goals are intended to be achieved by most children by the end of the Reception Year.
- The classroom is organised to promote the social skills and to develop the mathematical understanding of young children through stories, songs, rhymes and finger games, board games, sand and water, construction on a large and small scale, imaginative play, outdoor play, cooking and shopping, 2 and 3-D creative work with a range of materials and by observing numbers and patterns in the environment and daily routines.

## **STRATEGIES FOR TEACHING**

Mathematics lessons follow the Renewed Framework, with a structure of:

- Oral and mental starter for 10 – 15 minutes
- Main activity for about 30 minutes in KS1 and 40 minutes in KS2
- Plenary session for approximately 10 minutes (this can be during or at the end of the lesson)

Mental arithmetic is a key feature, with children being taught a range of strategies to work out answers as well as demanding a quick recall of simple mathematical facts. The teacher gives demonstrations and explanations, with an emphasis on the use of appropriate mathematical language and engages in whole class interactive teaching, involving:

- Whole class and group discussions
- Practice to consolidate specific skills
- Problem solving and investigational activities in order to learn how to break down a problem
- Practical activities
- Mathematical games and puzzles.

The use and application of mathematical principles (AT 1) underpins the whole of mathematical teaching and learning. Opportunities are given so that pupils can apply their knowledge to a wide range of real life situations. They need to be able to choose appropriate equipment and methods for the task and to enable them to communicate and justify their findings in a manner appropriate to their age and ability, showing increasing concern for clarity and accuracy of meaning.

## **DIMENSIONS WITHIN MATHEMATICS TEACHING**

### **Class organisation**

From Year 1, all pupils will have a dedicated daily mathematics lesson four days per week. When the children are in the juniors they are split into four ability sets based on a combination of teacher assessment from their previous teacher, test data and initial assessments in their new class. This enables the class teacher to reach the needs of each individual pupil.

### **The full range of pupil attainment**

Teaching will be planned to provide for the normal full range of prior attainment within each class. Throughout the lesson the teacher will have these needs in mind and will direct questions and provide activities to cater for this range of pupils. It will normally be satisfactory to think in terms of three broad levels of understanding and to plan accordingly. Teacher's plans are aimed at the average attaining child and then differentiated when necessary.

### **Able pupils**

Able pupils will normally work on the same topics as the rest of the class, but activities must be planned to stretch their abilities. This may be done by providing more demanding questions and investigations, often with a more open-ended approach. Pupils may at times be working on the objectives from the year above their peers.

### **Lower attaining pupils**

Lower attaining pupils will normally work on the same topics as the rest of the class, but activities must be planned to enable them to succeed. They may at times be working from the objectives for the year below their peers. In addition, the *Spring Board* and *Wave 3* resources for Key Stage Two may be used to support and consolidate learning.

### **Special Needs**

Those children with an Individual Education Plan should have specific targets each term for mathematics where appropriate.

### **Health and Safety**

Issues of Health and Safety in mathematics (to be read alongside the school's policy) include care and safety when using scissors and pairs of compasses.

### **Equal Opportunities**

All children have equal access to mathematical activities. We pay particular attention to ensuring there is no gender bias in materials or in access to resources, including ICT. Teachers should pay attention to the equal distribution of their questions across all groups.

Any displays and references to mathematics in society, should show positive role models of gender, race, ethnicity and disabilities.

## **ICT**

The use of ICT is an integral part of mathematics teaching and learning. Teachers will use the NNS Interactive Teaching Programme (ITP) and other software such as 'Espresso' and 'Education City' as a resource to enhance their teaching. Teachers use interactive whiteboards to enhance learning using programmes such as ITP, 'Mathszone' ([www.mathszone.co.uk](http://www.mathszone.co.uk)) and Primary games ([www.primarygames.co.uk](http://www.primarygames.co.uk)).

## **Homework**

Homework should be given as a consolidation or extension of work covered in school through mathematical problems, questions, games and puzzles as appropriate.

## **Spiritual, Moral, Social and Cultural**

There are many opportunities to develop a sense of wonder in mathematics, e.g. in structure and patterns of shape and number, in concepts such as probability and infinity. Teaching should also emphasise that the mathematics we know and use today is the result of human activity over a very long period of time and in many diverse cultures across the world.

## **MATHEMATICS ACROSS THE CURRICULUM**

This is an important area for development so that opportunities are made to ensure that appropriate mathematical activities take place in other curriculum areas such as geography, technology, PE and science.

## **Planning**

Year groups will construct a medium term plan for the year based on the objectives contained in the *Framework for teaching mathematics*. They may make use of and adapt the *Sample medium-term plans* published by the National Numeracy Strategy.

Weekly and daily planning is completed using a standard pro-forma in line with the recommendations of the National Numeracy Strategy. Unit Plans published by the Numeracy Strategy may be used. Teachers also have access to a published scheme (Abacus Mathematics) which supports the planning, teaching and assessing of numeracy across all three stages.

None of the above describe differentiation in any detail. It is expected that for each unit of work, the class teacher adapts, simplifies and extends the objectives and tasks for the specific needs of their class.

## Assessment

Assessment will take place at three connected levels: formative, medium term and summative. These assessments will be used to inform teaching in a continuous cycle of planning, teaching and assessment.

Teaching a unit of work will need careful initial and ongoing planning, informed by an assessment of children's learning. A cycle that supports this process in the Primary Framework for mathematics is set out below:

### **assess – plan – teach – practise – apply - review**

**Formative assessment** is carried out informally during the course of teaching by looking at the National Curriculum criteria. It enables the teacher to identify a child's understanding and progress in particular aspects, to inform their immediate teaching and to plan for their coming lessons. This can take the form of:

- Small group discussions in the context of a practical task
- Short tests given in oral or written form at the end of each unit of work
- Specific assignments for individual children
- Individual discussions with children to evaluate progress and to set new targets.

**Medium term assessments** are planned into the work as discrete assessment opportunities. They may take the form of short tests and serve to inform the teacher of the extent to which learning objectives have been met.

**Summative assessment** is carried out annually in KS2 using the end of key stage testing and the QCA optional tests. In KS1 there is baseline assessment and end of key stage testing.

The school uses *NFER Mathematics tests* to help moderate national curriculum assessment.

## Self assessment

Where possible children should be involved in assessing their own work. This might include:

Traffic Lights – How did they find the work? (red/yellow/green)

W.I.L.F (What I'm Looking For) – linked to objectives/success criteria.

Peer assessment – peers thoughts will be discussed.

## MARKING

Effective marking of pupils work identifies what they have done well and any misconceptions. It sets short term targets for what they need to do next and for improvement. It is not necessary to mark every calculation. Teacher judgements can be accurately made from an overview of a piece of work. Time is allowed for some marking to be done with the pupil, so that discussion and explanation can take place.

Feedback is given to the children as soon as possible.

- This aims to encourage and to give guidance for future work.
- The display of children's mathematical work gives them pride in their achievements.
- Some marking will be immediate, depending on the activity and the age of the children.

## RECORD KEEPING

Records are kept of the extent to which each child in the class has achieved the key objectives. This is recorded on a class tracking sheet to show each pupils progress throughout the year. Teachers may also use the National Curriculum Criteria to accurately teacher assess and will highlight pupil's progress throughout the year. For a few pupils additional records will be needed of the difficulties they experience or of exceptional progress made.

## **TARGET SETTING**

All children will have a quantitative target for the National Curriculum level they are expected to achieve by the end of the school year. This will be based on their level at the start of the year. Children will also have a target of the level they are expected to attain by the end of the key stage. The headteacher and class teachers will be engaged in agreeing these targets, making use of National Curriculum assessments, teacher assessments and progress expectations for the individual child.

Teachers should also set qualitative targets for what they expect children to learn in the short term.

## **REPORTING TO PARENTS**

Reporting is carried out through the regularly parent / teacher consultation meetings and annually through the written report. Parents are given teacher assessments and the results of optional national curriculum assessments. They should be provided with information on children's areas of strength and weakness and on their rate of progress in mathematics.

## **MONITORING AND EVALUATION**

The purpose of monitoring and evaluation activities is to raise the overall quality of teaching and levels of pupil attainment. The mathematics co-ordinator and Headteacher will monitor the quality of teaching and learning as part of the school's self-evaluation policy. Monitoring will include:

- Scrutiny of planning
- Quality of teaching through lesson observation and feedback
- Moderation of standards in children's work
- Evaluation of children's attainment against targets

As part of external monitoring the LEA inspector and numeracy consultant may carry out similar evaluations from time to time. The quality of mathematics in the school will also be inspected as part of any Ofsted inspection of the school as whole.

**The role of the mathematics co-ordinator** is to:

- Take the lead in policy development and review, including the continuing successful implementation of the Renewed Framework for Mathematics.
- Support colleagues in the development of weekly plans and in assessment and record keeping activities.
- Keep up-to-date on local and national initiatives and disseminate information

- Take responsibility for the purchase and organisation of mathematical resources
- Analyse pupils' test results to inform future policy, set school targets for mathematics in conjunction with the senior leadership team, and to assist staff in setting individual pupil and group targets.
- Take the lead in writing the mathematics section of the School Development Plan.
- Encourage the professional development of staff.

### **The role of Teaching Assistants**

- In the oral and mental starters the Teaching Assistant should sit with an identified group of children and should model what the teacher is doing using similar or adapted resources.
- In the main activity they should be assisting a group of children to complete a piece of work planned by the teacher.
- In plenaries they should encourage pupils they have worked with to feed back and contribute to the overall session.
- All the children have an equal entitlement to teaching time from the teacher. Therefore the teaching assistant should not always work with the same group of pupils. It may be appropriate on some occasions for a group to be withdrawn with the teaching assistant during the main activity group work. However, they should not be withdrawn for the oral and mental starter or for the teaching input of the main part of the lesson, or for the plenary.

### **Numeracy Strategy Resources and Publications**

- *Mathematical Vocabulary Book*
- *Springboard Y3 – 6*
- *Units Plans Y1 – 6*
- *Using Assessment and Review Lessons (DfES 0632/2001)*
- *Assessment Toolkit to support pupils with EAL (Dfes 0319/2002)*
- *Guidance to support pupils with specific needs in the daily mathematics lesson (DfES 0545/2001)*
- *Wave 3 Mathematics (DfES 0389/2003)*
- *Mathematics challenge for able pupils*

### **Annexes**

- Attached to this policy are annexes containing agreed school formats for planning and record keeping.

### **Review date**

This policy was agreed by governors on 19.6.10 and will be reviewed in Summer 2012.

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January 2010